

Cetacean Vessel Strikes 2008-17 from document Pacific cetacean vessel strike reports and investigations 2008-2017, Spaven et al.

DFO CASE NUMBER	SPECIES	YEAR	MONTH	GENERAL LOCATION	VESSEL STRIKE CONFIDENCE	RESPONSE TYPE	NECROPSY PERFORMED?	CAUSE OF DEATH - confirmed by necropsy
3248	Minke Whale	2008	Apr	Southern Gulf Islands	Not Assessed	Followed-up & no on-scene action warranted	No	
3259	Humpback Whale	2008	May	Ucluelet	Yes	Followed-up & no on-scene action warranted	No	
3261	Minke Whale	2008	Jan	Victoria	Yes	Followed-up & no on-scene action warranted	No	
3344	Humpback Whale	2008	Jul	Banks Island	Yes	Followed-up & no on-scene action warranted	No	
3355	Humpback Whale	2008	Jul	Barkley Sound	Yes	Followed-up & no on-scene action warranted	No	
3370	Humpback Whale	2008	Aug	Barkley Sound	Could not be determined	On-scene response	No	
3415	Humpback Whale	2008	Sep	Tofino	Yes	On-scene response	No	
3425	Humpback Whale	2008	Nov	Prince Rupert	Yes	On-scene response	Yes	Undetermined
3444	Gray Whale	2008	Oct	Clayoquot Sound	Yes	On-scene response	No	
3480	Pacific White-sided Dolphin	2008	Dec	Qualicum	Yes	Followed-up & no on-scene action warranted	No	
3485	Gray Whale	2008	Sep	Unknown, South Coast	Yes	No response	No	
4865	Dall's Porpoise	2008	Oct	Strait of Georgia	Could not be determined	Followed-up & no on-scene action warranted	No	
4897	Humpback Whale	2008	Nov	Bella Bella	Yes	Followed-up & no on-scene action warranted	No	
4899	Humpback Whale	2008	Mar	Bella Bella	Yes	Followed-up & no on-scene action warranted	No	
5028	Fin Whale	2009	Jul	Vancouver	No	On-scene response	Yes	Main nutrition
5032	Humpback Whale	2008		Princess Royal Island	Not Assessed	Unknown	No	
5072	Harbour Porpoise	2009	Jul	Nanaimo	Could not be determined	On-scene response	No	
5137	Humpback Whale	2009	Aug	Ucluelet	Yes	Followed-up & no on-scene action warranted	No	
5263	Humpback Whale	2009	Sep	Barkley Sound	Yes	On-scene response	No	
5267	Humpback Whale	2009	Sep	Tofino	Could not be determined	On-scene response	No	
5269	Humpback Whale	2009	Sep	Bella Bella	Could not be determined	On-scene response	No	
6014	Humpback Whale	2010	May	Graham Island, West	Yes	Followed-up & no on-scene action warranted	No	
6082	Humpback Whale	2009	May	Moresby Island	Yes	Followed-up & no on-scene action warranted	No	
6083	Humpback Whale	2010	Sep	Rivers Inlet	Yes	Followed-up & no on-scene action warranted	No	
6095	Humpback Whale	2010	Jul	Graham Island, Langara	Not Assessed	Followed-up & no on-scene action warranted	No	
6096	Humpback Whale	2010	Jul	Graham Island, Langara	Not Assessed	Followed-up & no on-scene action warranted	No	
6097	Humpback Whale	2010	Jul	Graham Island, Langara	Not Assessed	Followed-up & no on-scene action warranted	No	
6230	Gray Whale	2010	Aug	Port Renfrew	Yes	Followed-up & no on-scene action warranted	No	
6671	Gray Whale	2011	Jun	Kyuquot	Yes	Followed-up & no on-scene action warranted	No	
6847	Harbour Porpoise	2011	Aug	Southern Gulf Islands	Could not be determined	Followed-up & no on-scene action warranted	No	
6855	Humpback Whale	2011	Sep	Kitimat	Yes	Followed-up & no on-scene action warranted	No	
6887	Humpback Whale	2011	Aug	Johnstone Strait	Yes	On-scene response	No	
6889	Killer Whale	2011	Jul	Southern Gulf Islands	Could not be determined	Followed-up & no on-scene action warranted	No	
9519	Killer Whale	2011	Jul	Southern Gulf Islands	Not Assessed	Followed-up & no on-scene action warranted	No	
9615	Humpback Whale	2012	Apr	Haida Gwaii	Yes	Followed-up & no on-scene action warranted	No	
12-XXXX	Humpback Whale	2012	4	Haida Gwaii	Yes	On-scene response	Not warranted - animal alive or not resighted	
12-0071	Harbour porpoise	2012	5	Mcauley Pt	unknown	On-scene response	Unknown	
12-0156	Humpback Whale	2012	6	Haida Gwaii	Not assessed	Unknown	Not warranted - animal alive or not resighted	
12-0164	Humpback Whale	2012	7	Campbell River	Not assessed	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	
12-0201	Humpback Whale	2012	7	Bella Bella	Not assessed	On-scene response	Not warranted - animal alive or not resighted	
12-0211	Humpback Whale	2012	7	Haida Gwaii	Yes	Followed-up & no on-scene action warranted	Unknown	
12-XXXX	Humpback Whale	2012	8	Port Hardy	Yes	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	
12-0278	Killer whale	2012	8	Vancouver	unknown	Unknown	Not warranted - animal alive or not resighted	

DFO CASE NUMBER	SPECIES	YEAR	MONTH	GENERAL LOCATION	VESSEL STRIKE CONFIDENCE	RESPONSE TYPE	NECROPSY PERFORMED?	CAUSE OF DEATH - confirmed by necropsy
12-0395	Unidentified dolphin or porpoise	2012	12	Vancouver	unknown	Unknown	Not warranted - animal alive or not resighted	
13-0110	Humpback Whale	2013	5	Port Hardy	Not assessed	Unknown	Not warranted - animal alive or not resighted	
14-0008a	Humpback whale	2014	1	Prince Rupert	Could not be determined	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	
14-0046	Harbour Porpoise	2014	3	Pender Island	Yes	On-scene response	Yes	unknown - do not have copy of report
14-0257	Humpback Whale	2014	8	Prince Rupert	Not assessed	Followed-up & no on-scene action warranted	unknown	
15-0127	Fin Whale	2015	5	Vancouver	Yes	On-scene response	Yes	unknown - do not have copy of report
15-XXXX	Cuvier's Beaked Whale	2015	5	Tofino	Yes	On-scene response	Yes	unknown - do not have copy of report
15-0320	Humpback Whale	2015	8	Klemtu	Yes	Followed-up & no on-scene action warranted	Yes	unknown - do not have copy of report
15-0321	Humpback Whale	2015	8	Powell River	Not assessed	Unknown	Not warranted - animal alive or not resighted	
15-0372	Fin Whale	2015	8	Hecate Strait	Yes	On-scene response	Yes	unknown - do not have copy of report
15-0382	Killer Whale	2015	8	Campbell River	Not assessed	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	
15-0451	Killer Whale	2015	9	Campbell River	Yes	On-scene response	Not warranted - animal alive or not resighted	
16-0197	Humpback Whale	2016	5	Tofino	Yes	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	
16-0252	Humpback Whale	2016	6	Campbell River	Not assessed	Unknown	Not warranted - animal alive or not resighted	
16-0267	Unidentified Cetacean	2016	7	Bella Bella	Yes	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	
16-0311	Humpback Whale	2016	8	Bella Bella	Not assessed	No response	Unknown	
16-0319	Humpback Whale	2016	8	Terrace	Not assessed	Unknown	Not warranted - animal alive or not resighted	
16-XXXX	Killer Whale	2016	8	unknown	Yes	Unknown	Not warranted - animal alive or not resighted	
16-XXXX	Gray Whale	2016	9	Ucluelet	Not assessed	On-scene response	Not warranted - animal alive or not resighted	
16-0611	Humpback Whale	2016	11	Kitimat	Not assessed	Unknown	Not warranted - animal alive or not resighted	
16-0638	Killer Whale	2016	12	Powell River	Yes	On-scene response	Yes	unknown - do not have copy of report
17-0039	Killer Whale	2017	2	Haida Gwaii	Unknown	On-scene response	Yes	unknown - do not have copy of report
17-XXXX	Gray Whale	2017	5	Port McNeill	yes	No response	Not warranted - animal alive or not resighted	
17-XXXX	Sperm Whale	2017	6	Bella Bella	Could not be determined	On-scene response	No	
17-XXXX	Unidentified cetacean	2017	6	Haida Gwaii	Yes	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	
17-XXXX	Humpback Whale	2017	7	Campbell River	Yes	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	
17-XXXX	Humpback Whale	2017	8	Victoria	Yes	Unknown	Not warranted - animal alive or not resighted	
17-XXXX	Humpback Whale	2017	9	Klemtu	Not assessed	Unknown	Not warranted - animal alive or not resighted	
17-0633	Humpback Whale	2017	10	Port McNeill	Yes	On-scene response	Not warranted - animal alive or not resighted	
17-0642	Humpback Whale	2017	10	Ucluelet	Unknown	On-scene response	Yes	unknown - do not have copy of report

Cetacean Vessel Strikes 2008-17 from document Pacific cetacean vessel strike reports and investigations 2008-2017 Spaven.xlsx

DFO CASE NUMBER	SPECIES	YEAR	MONTH	GENERAL LOCATION	VESSEL STRIKE CONFIDENCE	RESPONSE TYPE	NECROPSY PERFORMED?	CAUSE OF DEATH - confirmed by necropsy
17-0702	Humpback Whale	2017	11	Klemtu	Not assessed	Followed-up & no on-scene action warranted	Not warranted - animal alive or not resighted	

Data sources and content

Summary information about the number of reports of vessel strikes/collisions – including basic data on numbers of reports by month, year, species, location, and resulting level of follow-up and certainty of strike having occurred.

- 1 Vessel collisions are defined as all physical interaction between a vessel of any size and a cetacean, regardless of the level of resulting injury, though I did include cause of death, if known from necropsy
- 2 The Marine Mammal Response Program was not in effect until 2008, so no data is included before 2008.

- 4 Data from 2012-2017 may not be complete as the dataset held by Lisa Spaven (DFO Science) is awaiting data input from MMRP

- 5 The spreadsheet is not limited to only cases that were investigated by DFO, as the definition of investigate could include something as simple as a follow-up phone call or as extensive as a full necropsy. For this reason, all records regardless of response level have been included and categorized.

Data quality

The data are filtered for duplicate reports to the best of our knowledge. Often there is more than one report made of a single witnessed event. Though the request specifies "reports" efforts have been made to eliminate duplicates to ensure that the data are not skewed based on repeat reports. These data therefore a representation of "cases" or "events" rather than "reports".

- 1 The dataset is not georeferenced in its entirety, so the general locations listed are based on the closest main city or area and are therefore not representative of point sources of data, but rather events/reports within an general area. The location may not be the location of the actual unwitnessed vessel strike event, as dead animals drift and can be reported much later at a different location.

- 2 The dataset reflects reports of vessel strikes - the confidence column provides the level of confidence assigned to the report based on available information and follow-up investigation.
- 3

Wright, Brianna

From: Wright, Brianna
Sent: June 29, 2018 1:19 PM
To: Nichol, Linda
Subject: FW: A109 Injury
Attachments: 2015-08-22_1514_edit.jpg

More info from Jared on the other individuals in the A23 matriline that have been struck by vessels in the past.

- Brianna

From: Jared Towers [mailto:j[REDACTED]]
Sent: June-29-18 12:41 PM
To: Wright, Brianna
Subject: Re: A109 Injury

A95 was hit by a prop in the same place as A60 and A109 in 2015 (attached). A61 was also hit by a boat the same year (or 2014) but wounds were either superficial or not apparent.

JT

On Fri, Jun 29, 2018 at 12:19 PM, Wright, Brianna <Brianna.Wright@dfo-mpo.gc.ca> wrote:

Interesting... besides A60, who was the other whale that was struck?

- B

From: Jared Towers [mailto:j[REDACTED]]
Sent: June-29-18 11:18 AM
To: Pilkington, James
Cc: [REDACTED]; john.ford@ubc.ca; Wright, Brianna; Nichol, Linda; Doniol-Valcroze, Thomas; Abernethy, Robin; Spaven, Lisa; Cottrell, Paul
Subject: Re: A109 Injury

Thanks James! Can't believe 3 out of the 5 in this matriline have been struck by props now. Must be pretty recent as A109 looked good in Nicole's pics from May 30th.

cheers, JT



AG0

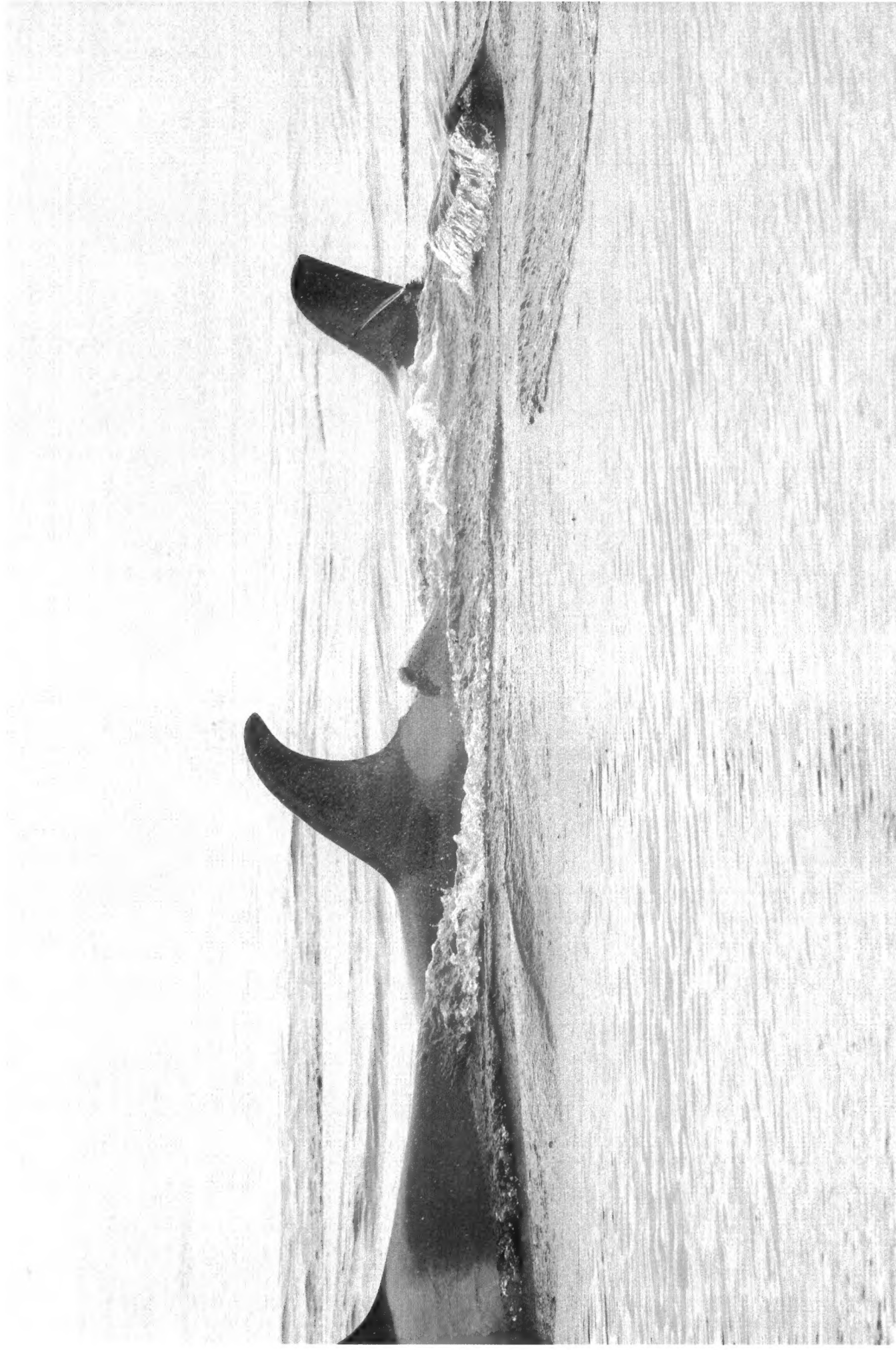
On Fri, Jun 29, 2018 at 8:17 AM, Pilkington, James <James.Pilkington@dfo-mpo.gc.ca> wrote:

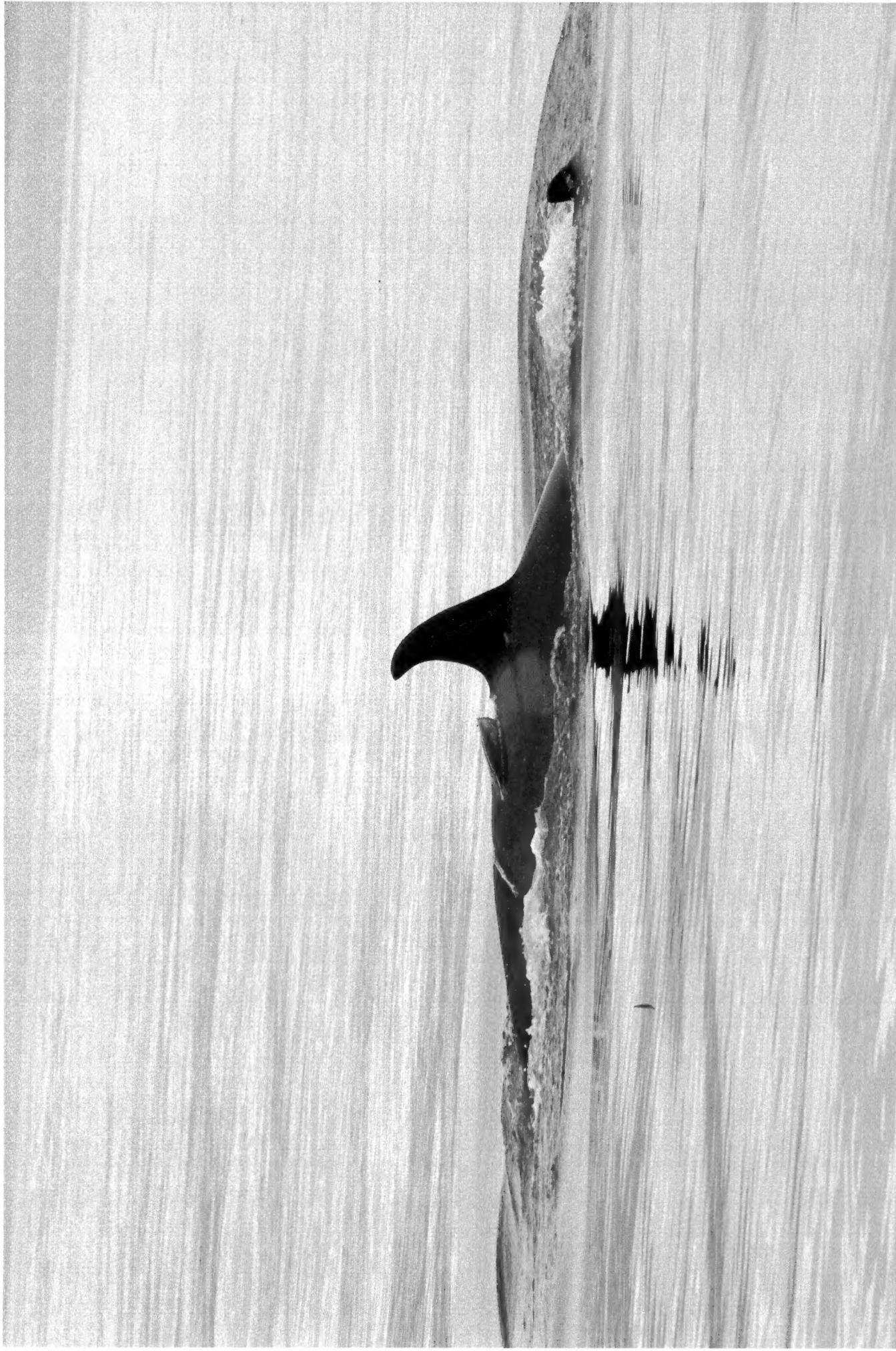
Hi All,

Just a quick heads up that A109 has some fresh and deep wounds on it's back that look like a vessel strike. Brianna took the attached pics during an encounter we had off of Cape Caution on the 24th. The whale looked to be relatively healthy and moving normally. Being in a commonly observed matriline, I'm sure word will spread quite quickly once the A23's make their way into the straits and there will be lots of follow up opportunities for monitoring, but wanted people to be aware.

All the best,

James





Wright, Brianna

From: Nichol, Linda
Sent: June 29, 2018 2:11 PM
To: Sloan, Lara; Kennedy, Eddy; MacConnachie, Sean
Cc: Doniol-Valcroze, Thomas; Wright, Brianna; Pilkington, James; Towers, Jared
Subject: Recent vessel strike injury to NRKW A109
Attachments: KWNR_2018-06-24_BWright_CapeCaution_0528.JPG; KWNR_2018-06-24_BWright_CapeCaution_0533.JPG

Hi Lara, Eddy and Sean,

Thomas has requested that I compile the following update for you about a recent vessel strike to a northern resident killer whale. The animal A109 and its matriline the A23's are well known and spend considerable time in Johnstone Strait and so it is likely that further reports of this injury will be made. So this is to give you the first report.

We have also provided this injury information to: Paul Cottrell, Lance Barrett-Lennard and John Ford – for your information

James and Brianna documented of A109.

On June 24th 2018, James Pilkington and Brianna Wright, near Cape Caution, observed and documented fresh and deep wounds on the back of A109 while collection Photo-IDs for the annual census.

I have asked Brianna to compile further contextual details for you:

A109 is a 4 years old (born 2014) and of unknown sex, its mother is A69 (21 year old female)
 A109 is the youngest of the 5 members of the A23 matriline, A05 pod (A clan northern residents)
 A109 was last seen (reported) on May 30 without the wound, so it has been less than a month since A109 was struck
 - the vessel strike injury is behind its dorsal fin, most of the strike marks are on the back and right side. A109 appeared to be swimming and behaving normally
 A109 was with the rest of its matriline the A23's, as well as ~30-35 other A & G clan individuals
 - 2 other animals from this matriline (only 5 animals in the matriline) have also been struck by vessels in recent years based on photo information and reports from Jared Towers also in our group. There is photo evidence of the injury to A60 from 2015 which is similar in placement and severity as those on A109. In 2014 or 2015 A61 was struck but the wounds were superficial.

Sincerely,

Linda Nichol, M.Sc.
 Marine Mammal Research Biologist,
 Aquatic Ecosystems and Marine Mammal Science Section,
 Ecosystem Science Division,
 Fisheries and Oceans Canada,
 Pacific Biological Station,
 3190 Hammond Bay Road,
 Nanaimo, B.C.,
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Final Report AHC Case: 16-6517

Last Updated: 05/23/17 1:02 PM
Pathologist: Stephen Raverly, DVM
Received Date: 12/22/16
Collected Date: 12/22/16
Client Ref No:

Veterinarian: **Dr. Marty Haulena**
Clinic: **Vancouver Aquarium**
Phone: (604) 659-3468
Fax: (604) 659-3469

Submitter: **John Ford - DFO**
Phone:

Owner: **Pacific Bio Station J. Fo**
Phone:
Premise ID:

Animal Data
Species: Killer Whale
Breed:
Sex: M
Age: 18 Years
Animal ID:

Case History

Submitted one Killer Whale for post mortem.

Possible ship strike, animal towed to Sechart for necropsy. One dead on Approx Dec 18, 2016

RR16-0638

***All histories are copied verbatim from the submission form**

Final Diagnosis

MORPHOLOGIC DIAGNOSES:

- 1). Thorax, left dorsolateral: Hemorrhage, subcutaneous, muscular, fascial and paravertebral, severe, segmental, acute with variable amounts of edema fluid (Gross diagnosis)
- 2). Skull: Hemorrhage, subcutaneous, marked, bilateral to circumferential, tracking (Gross diagnosis)
- 3). Occipital region, rostralateral blowhole, and acoustic fat: Hemorrhage, marked, multifocally extensive, acute (Gross diagnosis)
- 4). Skeletal muscle: Degeneration, discoid, moderate, multifocal to coalescing, with variable endomysial, epimysial and fascial edema
- 5). Skin: Dermatitis, superficial, perivascular and interstitial, mild to moderate, multifocal, subacute
- 6). Blowhole: Edema, submucosal, moderate, multifocal to coalescing, acute
- 7). Blowhole: Hyperplasia, lymphocytic, perivascular superficial submucosa, moderate, segmental
- 8). Adipose tissue, blubber: Edema, moderate to marked, multifocal, random, acute with occasional entrapment of adipocytes and disruption of collagen fibers
- 9). Lung: Pneumonia, mild, multifocal, random, nonsuppurative

There are no significant lesions within the peripheral nerves, peripheral vasculature, heart, larynx, urinary bladder, stomach, small intestine, colon, or liver.

COMMENTS:

Post mortem change significantly hampered microscopic assessment of the sectioned tissues and precluded evaluation

of multiple levels of the gastrointestinal tract. Although the animal was a code 2.5-3 at the time of necropsy, histopathology revealed considerably more advanced autolysis than appreciated with bacterial overgrowth. Sections of the blubber and skeletal muscle disclosed variable amounts of hypo to acellular proteinaceous fluid which effaces and entraps multiple fat cells, collagen bundles, myofibers and fascial planes and no apparent hemorrhage. The proteinaceous lakes within the blubber and skeletal muscle would have occurred antemortem and likely consist of edema fluid with variable amounts of hemolysed red blood cells. In select sections of skeletal muscle, there was multifocal to coalescing discoid myofiber degeneration consistent with prior reports of trauma associated lesions with ship strikes in stranded cetaceans; these changes are consistent with the animal having been alive at the time of presumptive impact and may not necessarily indicate the severity and pathologic consequences of injury. Due to the extent of hemorrhage in the neck and cranial thoracic region, the head was disarticulated, cleaned and a CT scan performed at the FP Innovation, University of British Columbia. Images were initially reviewed independently by Dr T McKleven of VCA Veterinary Speciality Centre of Seattle, WA and Dr S Dennison, Consultant Veterinary Radiology, Oakton, VA and a summary report was compiled. There were bone fragments noted in the rostral dorsal aspect of the skull. However, no fractures were apparent and the bone fragments were attributed to normal anatomic variation for this animal related to incomplete ossification. The last maxillary and mandibular teeth are lost and there are small mineralized deposits associated with the ear bones which most likely represent otoliths, mineralized granulomas and dystrophic calcification associated with ectopic parasite migration or long past inflammation. Age related articular degeneration was noted in both temporomandibular joints which may have impeded the ability of this animal toprehend or chew food. Sections of the blowhole mucosa revealed submucosal edema fluid which may substantiate the CT scan results of fluid accumulation within the nasal sacs and upper airway regions. Based on the changes within the blubber and skeletal muscle from the grossly noted presumed impact areas of the neck and cranial thorax, the fluid accumulation may be attributed to antemortem trauma. There was no apparent indication of inflammatory infiltrate or vasculopathy within this examined area. Sections of the kidney were too autolyzed to assess for myoglobinuria and in the skin, the inflammation within the apical portions of multiple fibrovascular rete may be attributed to localized trauma and necrosis or recruitment of infiltrate, antigenemia or some other process. The gross and histopathologic findings are consistent with trauma to the dorsolateral aspect of the cranial thorax, neck and head; the fluid accumulation noted within the air sacs and blowhole were noted microscopically and consistent with changes observed in the traumatic region along the torso. Harmful algal bloom analysis disclosed 0.6 ng/g of domoic acid in the urine with no appreciable levels identified in the stomach or intestinal contents or vitreous humour. Domoic acid exposure can result in significant neurologic signs and neuropathology in California sea lions and despite detection in a number of tissue samples (matrices) in cetaceans, there is still insufficient data to infer associated morbidity. It is unlikely that this level may have impeded the ability of this animal to avoid impact with a vessel. Routine microbiology yielded heavy and moderate mixed growth of *Edwardsiella tarda* and *Escherichia coli*, respectively from the colon with light moderate mixed growth of *E. tarda* and *Streptococcus* spp from the lung, liver and lymph node. There was heavy growth of *Streptococcus* spp from the brain with no *Salmonella* spp isolated from the colon. Based on the degree of post mortem change, these isolates are most likely due to post mortem tissue invasion and proliferation rather than primary pathogens. Polymerase chain reaction of pooled tissue for *Brucella* and morbillivirus proved negative and electron microscopy of the colon did not identify any virus like particles.

Necropsy

A 673 cm total length male killer whale (J34) with minimal reproductive activity is presented dead, Dec 21, 2016 and in moderate body and post mortem condition. There are moderate subcutaneous and pleural fat stores and the animal is well muscled. The axillary girth is 374 cm and the maximum girth is mid-thoracic and 425 cm. The blubber thickness at dorsal, midlateral and midventral levels at the cranial limit of the dorsal fin is 6.75 cm, 7 cm and 6.5 cm. The cut surface glistens and a small amount of oil oozes. Extending from thoracic vertebrae 8-10 cranially to the nape, along the left and to a much lesser extent, right dorsolateral aspect of the torso there is massive subcutaneous and fascial hemorrhage which extends multifocally deep into the subjacent epaxial skeletal musculature, is admixed with variable amounts of edema fluid and tracks along fascial planes deep to the periosteum of thoracic and cervical vertebrae. The hemorrhage and edema fluid dissects dependently and bilaterally along the fascial planes of the left and right sides of the skull to the throat and there is multifocally extensive hemorrhage along the periosteum of the left occipital bone, in the subcutaneous tissue rostralateral to blowhole and throughout the rostral third of the left acoustic fat. The lungs are moist and dark red with a small amount of serosanguinous fluid within bronchi. There is diffuse detachment of the gastric mucosa and the lumen contains a small amount of dark red fluid (possible ingested blood). The small intestine contains a small amount of grey orange chyme and there is a sparse amount of dull grey mucoid feces in the rectum. The bladder contains approximately 3 ml of turbid red yellow urine. There are no other apparent gross internal or external lesions.

Biological Data

Total length 673 cm

Snout flipper 167 cm

Flipper

Cranial insertion 138 cm

Case: 166517

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000012

Width 86 cm
Fluke width 200 cm
Snout to anus 234 cm
Bubber thickness
Dorsal 6.75 cm
Lateral 7 cm
Midventral 6.5 cm

COMMENTS:

The gross lesions are consistent with blunt force trauma and based on the anatomic site of impact, the sustained injuries would have contributed significantly to the demise of this animal. The tracking hemorrhage throughout the subcutis of the head suggests that the animal would have survived the initial trauma for a period time, prior to death. Although the brain was too autolyzed to assess for hemorrhage (coup contra-coup), a few bone spicules and sheaves up to 3-4 cm long were interspersed within the brain tissue. The skull has been flensed and arrangements are being made for CT imaging scans. Based on qualitative assessment, the animal was considered in moderate to good body condition and there were no apparent lesions or abnormalities which may have predisposed this animal to injury. Representative tissues have been harvested and will be analysed in house and forwarded to outside reference laboratories for additional testing. Further evaluation is pending histopathology and ancillary diagnostics.

GROSS DIAGNOSES:

- 1). Thorax, left dorsolateral: Hemorrhage, subcutaneous, muscular, fascial and paravertebral, severe, segmental, acute with variable amounts of edema fluid
- 2). Skull: Hemorrhage, subcutaneous, marked, bilateral to circumferential, tracking
- 3). Occipital region, rostralateral blowhole, and acoustic fat: Hemorrhage, marked, multifocally extensive, acute

Histopathology

Please refer to Morphologic Diagnoses.

Bacteriology

Aerobic Culture - Prod Resulted by: Erin Zabek Verified by: Roberta Yemen on 12/28/16 @ 1:47 PM

Specimen	ID	Isolate	Result	Level
Colon		Edwardsiella tarda	Positive	4+
Colon		E.coli (non-haemolytic)	Positive	2+
Lung		Edwardsiella tarda	Positive	2+
Lung		Streptococcus sp (non-haemolyt	Positive	3+
Lymph Node		Streptococcus sp (non-haemolyt	Positive	1+
Liver		Edwardsiella tarda	Positive	1+
Liver		Streptococcus sp (non-haemolyt	Positive	1+
Brain		Streptococcus sp (non-haemolyt	Positive	4+

Culture - Salmonella Resulted by: Erin Zabek Verified by: Roberta Yemen on 12/28/16 @ 1:47 PM

Specimen	ID	Isolate	Result	Level
Colon			No Salmonella sp. Isolated	

GNEG Resulted by: Erin Zabek Verified by: Roberta Yemen on 12/28/16 @ 1:48 PM

	Organism
Antibiotics	E.coli (non-haemolytic)
Enrofloxacin	s
Ceftiofur	s
Gentamicin	s
Neomycin	s
Ampicillin-Sulbactam	s
Sulphamethoxazole/Trimethoprim	s
Tetracycline	s
Florfenicol	s

Molecular Diagnostics

Brucella spp. Resulted by: A Scouras Verified by: Tomy Joseph on 12/28/16 @ 3:04 PM

Specimen	ID	Test	Result
Tissue	bladder, lg, lv, kd, LN, br	Brucella spp.	Negative

Test validation in progress.

Morbillivirus-Consensus Resulted by: A Scouras Verified by: Tomy Joseph on 12/28/16 @ 3:05 PM

Specimen	ID	Test	Result
Brain		Morbillivirus-Consensus	Negative
Tissue	bladder, lg, lv, kd, LN, br	Morbillivirus-Consensus	Negative

Test validation in progress.

Virology

Electron Microscopy Resulted by: Melissa Trapp Verified by: Tomy Joseph on 01/11/17 @ 10:10 AM

Specimen	ID	Isolate	Result	Level
Colon			Negative	



Stephen Raverty, DVM
Stephen.Raverty@gov.bc.ca

These results relate only to the animals or items tested.

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END OF REPORT

Wright, Brianna

From: Spaven, Lisa
Sent: September 27, 2016 4:14 PM
To: Wright, Brianna
Subject: RE: humpback vessel strikes

You're right – that is misleading. There are 20 strikes to HW that are either certain (14) or probable (6) included in this analysis. However, 9 of those are of uncertain severity. Therefore the annual rate of mortality or severe injury is 1.375. Based on reviewer suggestion this has recently been amended to the following:

“average over the eight year period of this assessment, a humpback whale was reported injured or killed from vessel strikes roughly every 9 months and a killer whale was reported injured or killed every two years (Figure 2).”

Lisa

From: Wright, Brianna
Sent: 2016–September-27 3:47 PM
To: Spaven, Lisa
Subject: humpback vessel strikes

Hi Lisa,

Quick question about your numbers for humpback vessel strikes – You report 20 individuals struck over eight years (2004-2011), but then in the results it says an average of 1.375 humpbacks struck per year over this time frame. Shouldn't it be $20 \text{ whales} / 8 \text{ years} = 2.5 \text{ whales struck per year on average}$?

Thanks,
- Bri